The Evening Sky Map

FREE* EACH MONTH FOR YOU TO EXPLORE, LEARN & ENJOY THE NIGHT SKY

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NORTHERN HEMISPHERE
DECEMBER 2014

Sky Calendar – December 2014

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2 **Moon near Uranus** (evening sky) at 0h UT. Mag. +5.8.

5 **Moon near the Pleiades** (evening sky) at 10h UT.

6 **Moon near Aldebaran** (midnight sky) at 3h UT.

6 **Full Moon** at 12:26 UT.

8 **Mercury at superior conjunction** with the Sun at 10h UT. The elusive planet passes into the evening sky.

9 **Moon near Pollux** (morning sky) at 15h UT.

10 **Moon near Beehive Cluster** (morning sky) at 19h UT.

12 **Moon near Jupiter** (117° from Sun, morning sky) at 1h UT. Mag. –2.3.

12 **Moon near Regulus** (morning sky) at 16h UT.

12 **Moon at apogee** (farthest from Earth) at 23h UT (distance 404,581 km; angular size 29.5').

14 **Geminid Meteor Shower** peaks at 12h UT. Major activity lasts almost 24 hours around peak time. Produces bright, medium-speed meteors at its peak (up to 80 meteors/hour). Most reliable meteor shower. Easy to observe (radiant shown on sky map). Best seen after midnight.

14 **Last Quarter Moon** at 12:53 UT.

17 **Moon near Spica** (61° from Sun, morning sky) at 3h UT.

19 **Moon near Saturn** (28° from Sun, morning sky) at 21h UT. Mag. +0.5.

21 **December solstice** at 23:03 UT. The time when the Sun reaches the point farthest south of the celestial equator marking the start of winter in the Northern Hemisphere and summer in the Southern Hemisphere.

22 **New Moon** at 1:35 UT. Start of lunation 1138.

23 **Moon near Venus** (14° from Sun) at 3h UT.

24 **Moon at perigee** (closest to Earth) at 17h UT (364,797 km; angular size 32.8').

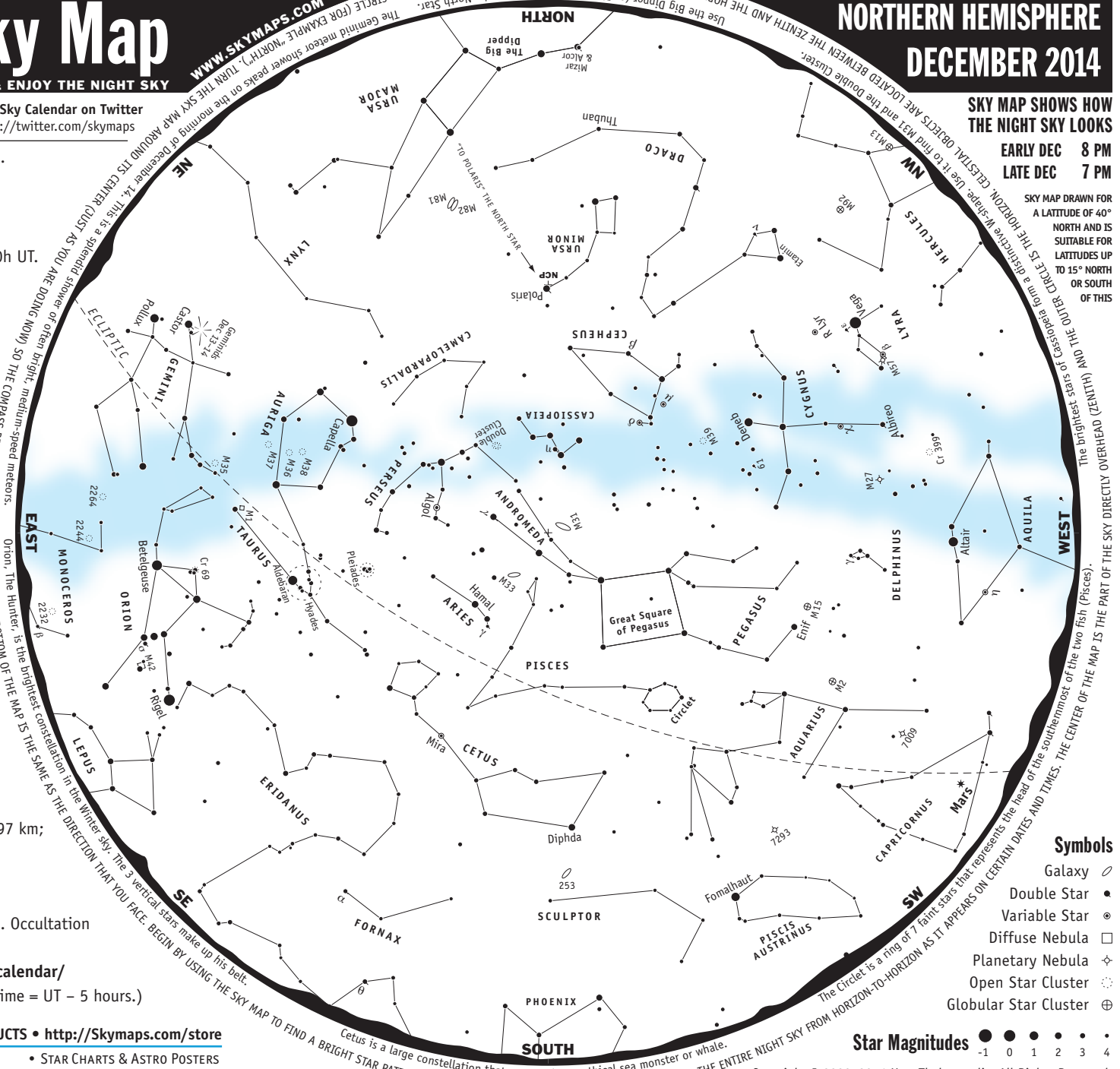
25 **Moon near Mars** (evening sky) at 5h UT. Mag. +1.1.

28 **First Quarter Moon** at 18:32 UT.

29 **Moon near Uranus** (evening sky) at 5h UT. Mag. +5.8. Occultation visible from Alaska, USA.

More sky events and links at http://Skymaps.com/skycalendar/

All times in Universal Time (UT). (USA Eastern Standard Time = UT – 5 hours.)



Use the Big Dipper (or Plough) to find Polaris, the North Star. COMPASS DIRECTIONS ARE INDICATED ALONG THE HORIZON CIRCLE (FOR EXAMPLE, "NORTH"). TURN THE SKY MAP AROUND ITS CENTER (JUST AS YOU ARE DOING NOW) SO THE COMPASS DIRECTION THAT APPEARS ALONG THE BOTTOM OF THE MAP IS THE SAME AS THE DIRECTION THAT YOU FACE. BEGIN BY USING THE SKY MAP TO FIND A BRIGHT STAR PATTERN IN THE SKY.

The Geminid meteor shower peaks on the morning of December 14. This is a splendid shower of often bright, medium-speed meteors.

Orion, The Hunter, is the brightest constellation in the Winter sky. The 3 vertical stars make up his belt.

Cetus is a large constellation that represents a mythical sea monster or whale.

The brightest stars of Cassiopeia form a distinctive W-shape. Use it to find M31 and the DOUBLE CLUSTER. CELESTIAL OBJECTS ARE LOCATED BETWEEN THE ZENITH AND THE HORIZON.

The Circlet is a ring of 7 faint stars that represents the head of the southernmost of the two fish (Pisces).

INSTRUCTIONS: THE SKY MAP SHOWS THE ENTIRE NIGHT SKY FROM HORIZON-TO-HORIZON AS IT APPEARS ON CERTAIN DATES AND TIMES. THE CENTER OF THE MAP IS THE PART OF THE SKY DIRECTLY OVERHEAD (ZENITH) AND THE OUTER CIRCLE IS THE PART OF THE SKY DIRECTLY UNDER YOUR FEET (NADIR).

SKY MAP SHOWS HOW THE NIGHT SKY LOOKS

EARLY DEC 8 PM
LATE DEC 7 PM

SKY MAP DRAWN FOR A LATITUDE OF 40° NORTH AND IS SUITABLE FOR LATITUDES UP TO 15° NORTH OR SOUTH OF THIS

Symbols

- Galaxy
- Double Star
- Variable Star
- Diffuse Nebula
- Planetary Nebula
- Open Star Cluster
- Globular Star Cluster

Star Magnitudes -1 0 1 2 3 4

KT

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About the Celestial Objects

Listed on this page are several of the brighter, more interesting celestial objects visible in the evening sky this month (refer to the monthly sky map). The objects are grouped into three categories. Those that can be easily seen with the naked eye (that is, without optical aid), those easily seen with binoculars, and those requiring a telescope to be appreciated. **Note, all of the objects (except single stars) will appear more impressive when viewed through a telescope or very large binoculars.** They are grouped in this way to highlight objects that can be seen using the optical equipment that may be available to the star gazer.

Tips for Observing the Night Sky

When observing the night sky, and in particular deep-sky objects such as star clusters, nebulae, and galaxies, it's always best to observe from a dark location. Avoid direct light from street lights and other sources. If possible observe from a dark location away from the light pollution that surrounds many of today's large cities.

You will see more stars after your eyes adapt to the darkness—usually about 10 to 20 minutes after you go outside. Also, if you need to use a torch to view the sky map, cover the light bulb with red cellophane. This will preserve your dark vision.

Finally, even though the Moon is one of the most stunning objects to view through a telescope, its light is so bright that it brightens the sky and makes many of the fainter objects very difficult to see. So try to observe the evening sky on moonless nights around either New Moon or Last Quarter.

Astronomical Glossary

Conjunction – An alignment of two celestial bodies such that they present the least angular separation as viewed from Earth.

Constellation – A defined area of the sky containing a star pattern.

Diffuse Nebula – A cloud of gas illuminated by nearby stars.

Double Star – Two stars that appear close to each other in the sky; either linked by gravity so that they orbit each other (binary star) or lying at different distances from Earth (optical double). Apparent separation of stars is given in seconds of arc (").

Ecliptic – The path of the Sun's center on the celestial sphere as seen from Earth.

Elongation – The angular separation of two celestial bodies. For Mercury and Venus the greatest elongation occurs when they are at their most angular distance from the Sun as viewed from Earth.

Galaxy – A mass of up to several billion stars held together by gravity.

Globular Star Cluster – A ball-shaped group of several thousand old stars.

Light Year (ly) – The distance a beam of light travels at 300,000 km/sec in one year.

Magnitude – The brightness of a celestial object as it appears in the sky.

Open Star Cluster – A group of tens or hundreds of relatively young stars.

Opposition – When a celestial body is opposite the Sun in the sky.

Planetary Nebula – The remnants of a shell of gas blown off by a star.

Universal Time (UT) – A time system used by astronomers. Also known as Greenwich Mean Time. USA Eastern Standard Time (for example, New York) is 5 hours behind UT.

Variable Star – A star that changes brightness over a period of time.

CELESTIAL OBJECTS

NORTHERN HEMISPHERE

DECEMBER 2014

Skymaps.com

Easily Seen with the Naked Eye

Altair	Aql	•	Brightest star in Aquila. Name means "the flying eagle". Dist=16.7 ly.
Capella	Aur	•	The 6th brightest star. Appears yellowish in color. Spectroscopic binary. Dist=42 ly.
δ Cephei	Cep	◉	Cepheid prototype. Mag varies between 3.5 & 4.4 over 5.366 days. Mag 6 companion.
Deneb	Cyg	•	Brightest star in Cygnus. One of the greatest known supergiants. Dist=1,400±200 ly.
Castor	Gem	◙	Multiple star system with 6 components. 3 stars visible in telescope. Dist=52 ly.
Pollux	Gem	•	With Castor, the twin sons of Leda in classical mythology. Dist=34 ly.
Vega	Lyr	•	The 5th brightest star in the sky. A blue-white star. Dist=25.0 ly.
Rigel	Ori	•	The brightest star in Orion. Blue supergiant star with mag 7 companion. Dist=770 ly.
Betelgeuse	Ori	•	One of the largest red supergiant stars known. Diameter=300 times that of Sun. Dist=430 ly.
Algol	Per	◉	Famous eclipsing binary star. Magnitude varies between 2.1 & 3.4 over 2.867 days.
Fomalhaut	PsA	•	Brightest star in Piscis Austrinus. In Arabic the "fish's mouth". Dist=25 ly.
Pleiades	Tau	◌	The Seven Sisters. Spectacular cluster. Many more stars visible in binoculars. Dist=399 ly.
Hyades	Tau	◌	Large V-shaped star cluster. Binoculars reveal many more stars. Dist=152 ly.
Aldebaran	Tau	•	Brightest star in Taurus. It is not associated with the Hyades star cluster. Dist=65 ly.
Polaris	UMi	◙	The North Pole Star. A telescope reveals an unrelated mag 8 companion star. Dist=433 ly.

Easily Seen with Binoculars

M31	And	⬭	The Andromeda Galaxy. Most distant object visible to naked eye. Dist=2.5 million ly.
M2	Aqr	⊕	Resembles a fuzzy star in binoculars.
η Aquilae	Aql	◉	Bright Cepheid variable. Mag varies between 3.6 & 4.5 over 7.166 days. Dist=1,200 ly.
M38	Aur	◌	Stars appear arranged in "pi" or cross shape. Dist=4,300 ly.
M36	Aur	◌	About half size of M38. Located in rich Milky Way star field. Dist=4,100 ly.
M37	Aur	◌	Very fine star cluster. Discovered by Messier in 1764. Dist=4,400 ly.
μ Cephei	Cep	◉	Herschel's Garnet Star. One of the reddest stars. Mag 3.4 to 5.1 over 730 days.
Mira	Cet	◉	Famous long period variable star. Mag varies between 3.0 & 10.1 over 332 days.
χ Cygni	Cyg	◉	Long period pulsating red giant. Magnitude varies between 3.3 & 14.2 over 407 days.
M39	Cyg	◌	May be visible to the naked eye under good conditions. Dist=900 ly.
ν Draconis	Dra	◙	Wide pair of white stars. One of the finest binocular pairs in the sky. Dist=100 ly.
M35	Gem	◌	Fine open cluster located near foot of the twin Castor. Dist=2,800 ly.
M92	Her	⊕	Fainter and smaller than M13. Use a telescope to resolve its stars.
ε Lyrae	Lyr	◙	Famous Double Double. Binoculars show a double star. High power reveals each a double.
R Lyrae	Lyr	◉	Semi-regular variable. Magnitude varies between 3.9 & 5.0 over 46.0 days.
Cr 69	Ori	◌	Lambda Orionis Cluster. Dist=1,630 ly.
M42	Ori	□	The Great Orion Nebula. Spectacular bright nebula. Best in telescope. Dist=1,300 light years.
M15	Peg	⊕	Only globular known to contain a planetary nebula (Mag 14, d=1"). Dist=30,000 ly.
Double Cluster	Per	◌	Double Cluster in Perseus. NGC 869 & 884. Excellent in binoculars. Dist=7,300 ly.
253	Scl	⬭	Fine, large, cigar-shaped galaxy. Requires dark sky. Member of Sculptor Group.
Cr 399	Vul	◌	Coathanger asterism or "Brocchi's Cluster". Not a true star cluster. Dist=218 to 1,140 ly.

Telescopic Objects

γ Andromedae	And	◙	Attractive double star. Bright orange star with mag 5 blue companion. Sep=9.8".
7009	Aqr	✧	Saturn Nebula. Requires 8-inch telescope to see Saturn-like appendages.
7293	Aqr	✧	Helix Nebula. Spans nearly 1/4 deg. Requires dark sky. Dist=300 ly.
γ Arietis	Ari	◙	Impressive looking double blue-white star. Visible in a small telescope. Sep=7.8".
η Cassiopeiae	Cas	◙	Yellow star mag 3.4 & orange star mag 7.5. Dist=19 ly. Orbit=480 years. Sep=12".
Albireo	Cyg	◙	Beautiful double star. Contrasting colours of orange and blue-green. Sep=34.4".
61 Cygni	Cyg	◙	Attractive double star. Mags 5.2 & 6.1 orange dwarfs. Dist=11.4 ly. Sep=28.4".
γ Delphini	Del	◙	Appear yellow & white. Mags 4.3 & 5.2. Dist=100 ly. Struve 2725 double in same field.
θ Eridani	Eri	◙	Striking blue-white double star. Mags 3.2 & 4.3. Visible in a small telescope. Sep=8.2".
β Lyrae	Lyr	◉	Eclipsing binary. Mag varies between 3.3 & 4.3 over 12.940 days. Fainter mag 7.2 blue star.
M57	Lyr	✧	Ring Nebula. Magnificent object. Smoke-ring shape. Dist=4,100 ly.
σ Orionis	Ori	◙	Superb multiple star. 2 mag 7 stars one side, mag 9 star on other. Struve 761 triple in field.
M1	Tau	□	Crab Nebula. Remnant from supernova which was visible in 1054. Dist=6,500 ly.
M33	Tri	⬭	Fine face-on spiral galaxy. Requires a large aperture telescope. Dist=2.3 million ly.
M81	UMa	⬭	Beautiful spiral galaxy visible with binoculars. Easy to see in a telescope.
M82	UMa	⬭	Close to M81 but much fainter and smaller.
M27	Vul	✧	Dumbbell Nebula. Large, twin-lobed shape. Most spectacular planetary. Dist=975 ly.

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